

- 1.a) Consider the second order system modelled by $\ddot{x} + x = (u + v)$ where v is an unknown disturbance bounded by $\|v\| < 1$. Design a VSC control such that the reduced order system obeys $\dot{x} = -2x$.
 - b) Simulate your system using an initial condition of $x(0)=10$, $\dot{x}(0) = 0$.
2. Repeat problem 1, but now force the system to track the time varying trajectory, $x_{ref} = 2 \cos 4t$.